S1 Line Strike Hwy 121 Incident – McKinney, TX
Preliminary Air Monitoring and Environmental Summary
February 01, 2017

Prepared by
Center for Toxicology and Environmental Health, L.L.C. (CTEH®)
On Behalf of Enterprise Products Partners, L.P.

CTEH CENTER FOR TOXICOLOGY AND ENVIRONMENTAL HEALTH, LLC

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Introduction

On January 30, 2017, the Center for Toxicology and Environmental Health, LLC (CTEH®) initiated air monitoring and sampling following a line strike to the Enterprise Products S1 pipeline near McKinney, TX. Real-time air monitoring and analytical sampling were initiated to monitor product recovery operations and the surrounding community. Real-time air monitoring consisted of roaming hand-held monitoring and fixed-remote telemetering stations. Analytical air sampling consisted of personal sampling and community air sampling.

This report summarizes air monitoring data recorded from January 31, 2017 at 07:00 to February 1, 2017 at 07:00. Appendix I contains incident site maps and sampling locations.

Real-time Air Monitoring[1]

Real-time air monitoring was conducted to document and quantify the potential release of fugitive emissions (if any) resulting from the release. All instrumentation was calibrated at least once per day or per manufacturer's recommendations. Target analytes were measured as total volatile organic compounds (VOCs), benzene, hydrogen sulfide (H_2S), toluene, hexane, and percent of the lower explosive limit (%LEL) using remote telemetering RAESystems® AreaRAEs, handheld instruments, such as RAESystems® MultiRAEs (MRs) and Gastec® colorimetric detection tubes. Fixed location monitoring was conducted using four AreaRAE monitoring stations (AR) placed along Hwy 121 along the incident site and work area.

[1] *Real-time air monitoring provides near instantaneous measurements for concentrations in air without the need for laboratory analysis.*

Table 1, presented below, summarizes data for roaming, hand-held instruments in the community and work area.

Table 1: Hand-held Real-time Air Monitoring Summary[1]

January 31, 2017 at 07:00 to February 1, 2017 at 07:00

Location Category	Analyte	Instrument	Count of Readings	Count of Detections	Range of Detections[2]
Community	%LEL	MultiRAE	27	0	< 1 %
	Benzene	UltraRAE	46	0	< 0.05 ppm
	Benzene	Gastec 121L	16	0	< 0.05 ppm
	Hexane	Gastec 102L	15	0	< 0.1 ppm
	Toluene	Gastec 122	8	0	< 1 ppm
	Toluene	Gastec 122L	4	0	< 0.5 ppm
	VOC	MultiRAE	88	2	0.3 - 1.2 ppm
Worker Monitoring	%LEL	MultiRAE	117	1	2 %
	Benzene	Gastec 121L	4	0	< 0.05 ppm
	Benzene	UltraRAE	123	61	0.05 – 2.65 ppm
	H_2S	Gastec 4LL	3	0	< 0.1 ppm
	H_2S	MultiRAE	87	0	< 0.1 ppm
	Hexane	Gastec 102L	6	3	1 – 15 ppm
	Toluene	Gastec 122	7	0	< 1 ppm
	Toluene	Gastec 122L	2	0	< 0.5 ppm
	VOC	MultiRAE	224	167	0.3 – 203.1 ppm

[1]Please Note: The data displayed in the above table has not undergone complete QC analysis and is presented in preliminary format.
[2]Maximum detections preceded by the "<" symbol are considered non-detections at the limit of detection (LoD) value to the right.

Table 2: Remote Telemetering Real-time Air Monitoring Summary[1]

January 31, 2017 07:00 to February 1, 2017 at 07:00

Unit	Analyte	Count of Readings	Count of Detections	Range of Detections[2]	Average of Detections
AR01	%LEL	4964	47	1.1 – 8.0 %	2.9 %
	VOC	4964	296	0.1 – 135.9 ppm	31.0 ppm
AR02	%LEL	5258	261	1.1 – 5.6 %	2.4 %
	VOC	5258	4605	0.1 – 204.5 ppm	7.2 ppm
AR03	%LEL	5234	0	< 1%	-
	VOC	5234	5204	0.1 – 109.4 ppm	20.6 ppm
AR04	%LEL	5283	0	< 1 %	-
	VOC	5283	4217	0.1 – 56.6 ppm	4.9 ppm
AR05	%LEL	4846	0	< 1 %	-
	VOC	4846	37	0.1 – 10.2 ppm	1.4

[1]*Please note: The data displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.*

[2]*Maximum detections preceded by the "<" symbol are considered at the limit of detection (LoD) value to the right.*

Analytical Air Sampling

Analytical air samples were collected during this time period to assess potential worker exposure and potential off-site migration of target analytes during product recovery operations. Five samples were collected in the breathing zone of personnel conducting various recovery operations and analyzed for benzene, toluene, ethylbenzene, xylene, and n-hexane in accordance with NIOSH Method 1501 and the OSHA benzene substance-specific standard. Four minican evacuated canister samples were set out in the community to assess for the potential presence of crude oil constituents. All samples will be sent to an American Industrial Hygiene Associate (AIHA) accredited laboratory for analysis of VOCs in accordance with USEPA TO-17.

Table 3: Cumulative Analytical Sample Count

January 31, 2016 07:00

Analyte	Count of Samples Collected	Count of Results Received from Lab	Count of Received Validated Data Reports
BTEX	5	0	0
Minican	4	0	0

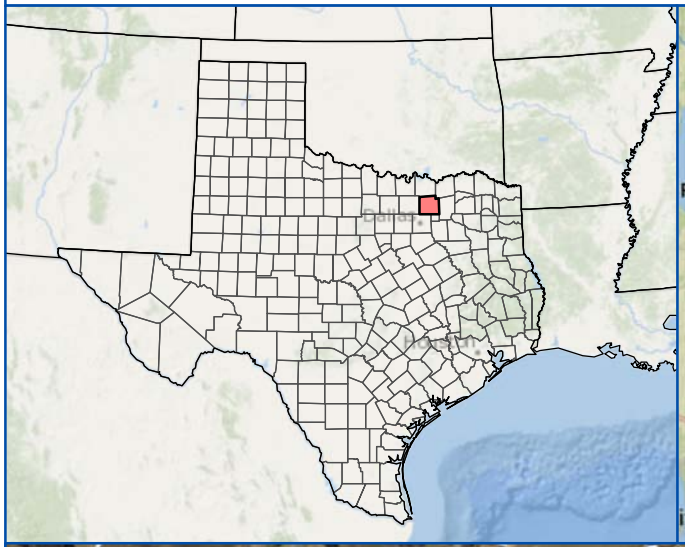
Appendix I:

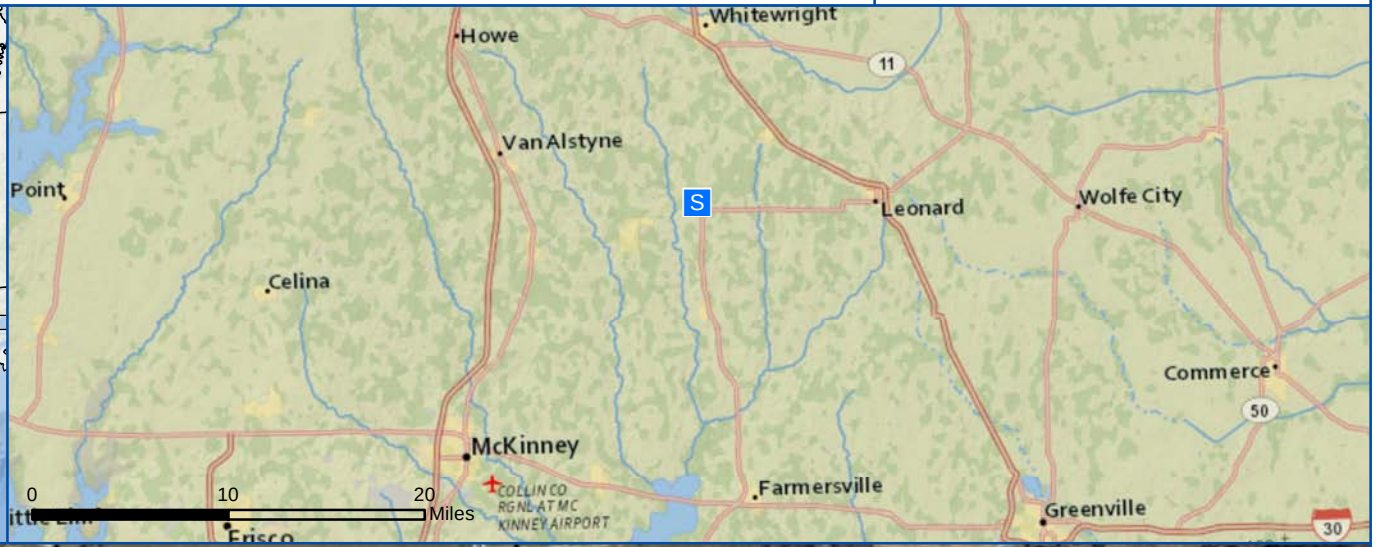
Incident Site Maps

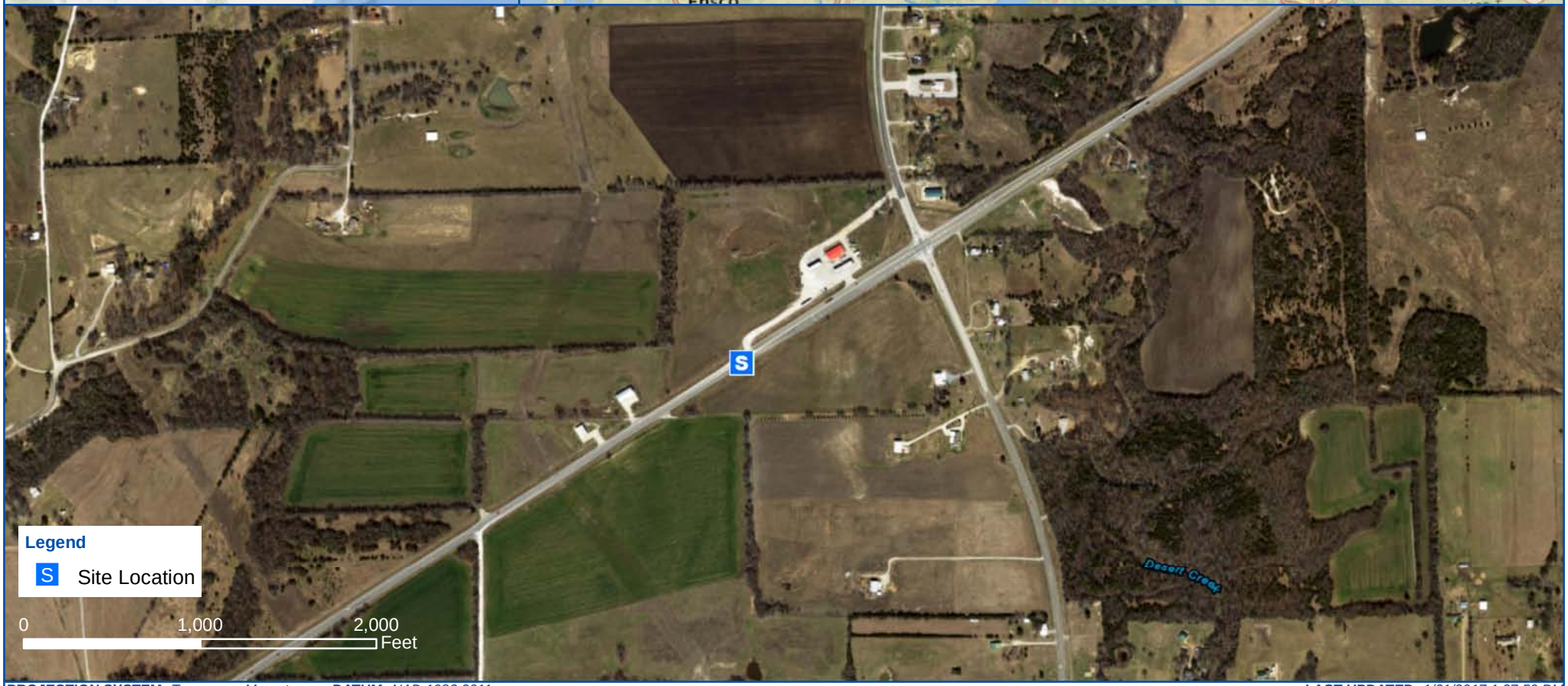
Incident Site Location

S1 Line Strike Hwy 121

Project: 108835
Client: Enterprise Products
City: McKinney, TX
County: Collin





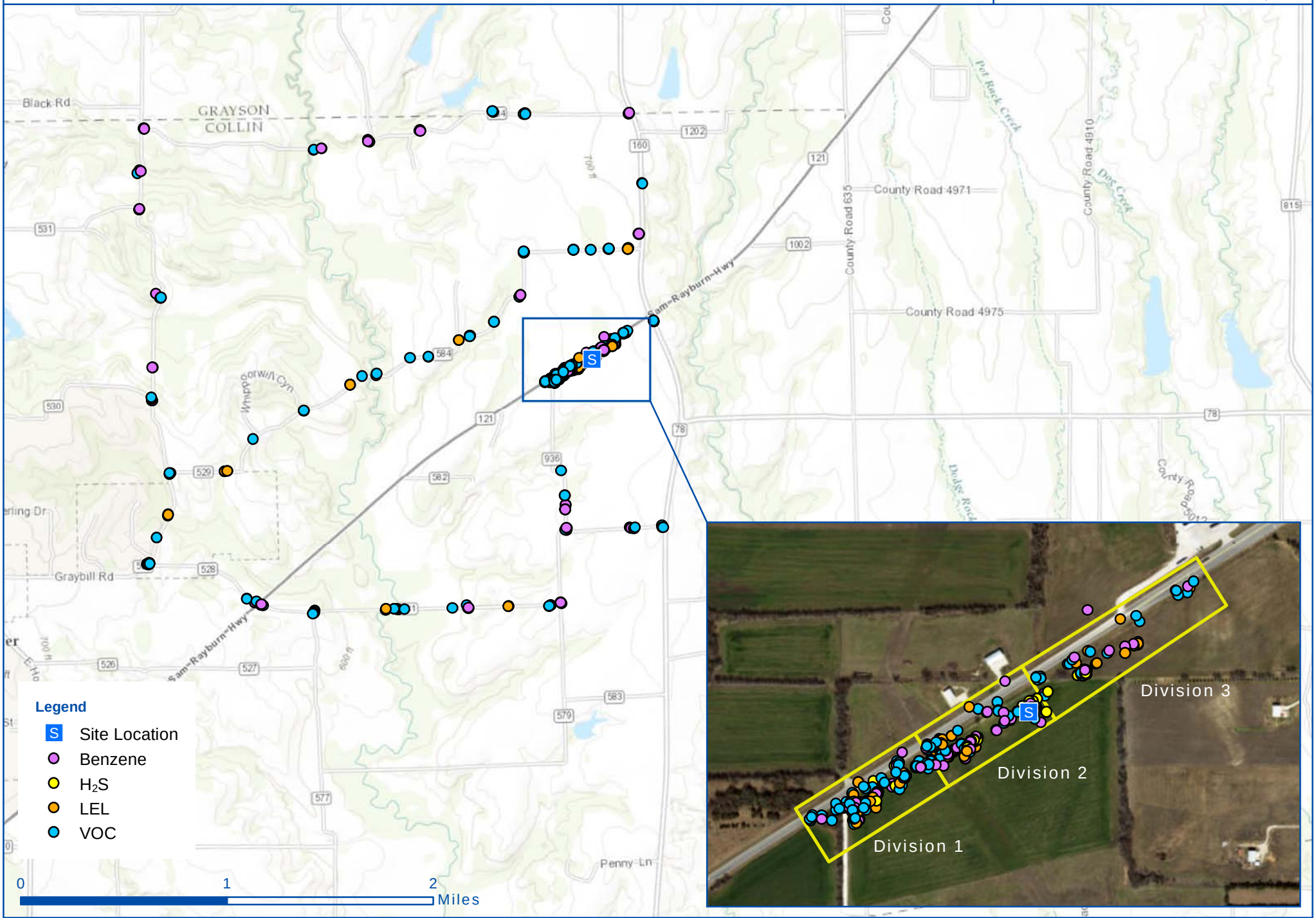


PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *NAD 1983 2011* **LAST UPDATED:** *1/31/2017 1:37:59 PM*

Manually-Logged Real-Time Air Monitoring Reading Locations

S1 Line Strike Hwy 121 Incident - January 31 at 07:00 to February 1 at 07:00

Project: 108835
Client: Enterprise Products
City: McKinney, TX
County: Collin

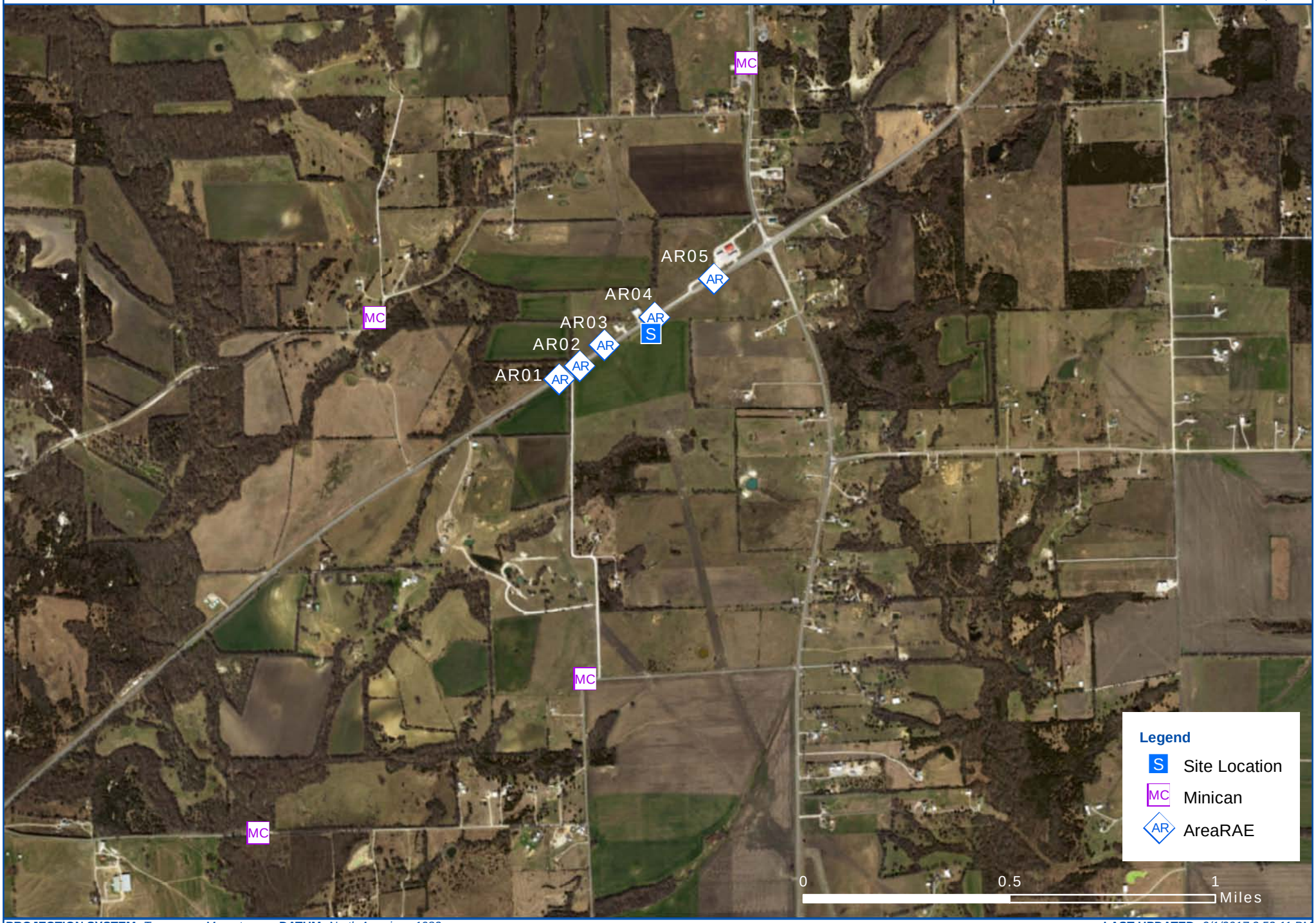


PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *NAD 1983 2011* **LAST UPDATED:** *2/1/2017 4:23:45 PM*

AreaRAE and Minican Locations

S1 Line Strike Hwy 121 Incident

Project: 108835
Client: Enterprise Products
City: McKinney, TX
County: Collin



PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *North American 1983* **LAST UPDATED:** *2/1/2017 3:53:11 PM*